The Crystal –
A Sustainable Cities Initiative
by Siemens

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Megatrends imply significant challenges for city decision makers

**Megatrends**

- **Globalization & Urbanization**
  - Global players / trade volume increase
  - 2030: 60% of population in cities
  - High density living demands for new patterns in infrastructure

- **Demographic Change**
  - 65+ generation will nearly double by 2030 (from 7% to 12%)
  - Need for adequate infrastructures as well as health- and elder care

- **Climate Change**
  - Cities responsible for ~70% GHG
  - Need for resource efficiency and environmental care

**Sustainable Urban Development**

- Cities are competing globally to make their urban areas attractive to live and to invest in

- **Challenge** to balance between competitiveness, environment and quality of life, and to finance infrastructure solutions
## Sustainable Green Growth – Siemens examples for energy efficiency in the city

Existing technology achieves high gains in efficiency and CO₂ abatement

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<th><strong>Renewables</strong></th>
<th><strong>CO₂-free energy to the city</strong></th>
<th><strong>Building technologies</strong></th>
<th><strong>Traffic management system</strong></th>
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| Wind turbines: Efficiency up from 1 MW to 3.6 MW | Example HVDC: China 800 kV, 6.4 GW, 2,000 km | 30% less energy used through building energy management | Traffic speed: +37%  
Commuter times cut by 17% | 12 tons less CO₂ emissions per ship and day by local grid connection |

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<th><strong>Efficient energy production</strong></th>
<th><strong>High-voltage urban link</strong></th>
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| Combined Cycle: From 50% to 60%  
Steam Power Plant: From 40% to 47% | Efficient energy transport by HV close to the consumer | 40% less energy consumption with variable-speed drives | Higher attractiveness of public transport (reduced waiting and up to 20% fuel savings) | Potential in Europe: 3.5 million tons less CO₂ emissions with LED systems |

- Higher attractiveness of public transport (reduced waiting and up to 20% fuel savings)
### Siemens references

#### Energy Saving Partnership, Berlin

**Energy-Saving Performance Contracts**

- **guarantee savings that fund upgrades**
  - Modernization of 164 public buildings
  - Guaranteed total cost savings of EUR 5.3 million p.a.
  - Immediately relieved city budget by a EUR 1.14 million
  - CO₂ emissions have been reduced to 29,000 tonnes/year (25%)

#### Example from Italy / Florence

- **tbd**
  - xxx
  - xxx
  - xxx

#### LED City Lighting, Regensburg

**A modern city needs high quality of lighting at low cost**

- Cut energy costs by 50% per year
- Individually controllable and homogeneous radiation
- Creates a warm white atmosphere
- Won 1st price of government competition “Energy efficient street lighting“

#### The Crystal, London

**A Sustainable Cities Initiative by Siemens**

- A global knowledge hub for urban sustainability and environmental technologies
- Aims to meet the highest local and global standards for sustainable buildings
The Crystal at a glance

- Combined exhibition and conference facilities with office space
- Audience includes key decision-makers and general public
- Dedicated Siemens hospitality activities during the 2012 Games
- Part of 2012 legacy, supporting local schools attracting green investment

Key Figures
- Exhibition: 2000m²
- Auditorium: 270 seats
- Office space: ca. 160 desks
- Expected visitors: 100,000+
Architectural Vision
The Crystal showcases existing technologies that support sustainable urban living.

State of the Art Building Management
- Extensive Use of Natural Light
- Low Energy Mixed Mode Ventilation
- Intelligent All Electric Building

Rainwater Harvesting and Recycling
- Blackwater Recycling
- Heating Designed for Maximum Efficiency
- Multifaceted and Sustainable Landscaping
The Building is Walking the Talk

The Crystal will demonstrate excellence in sustainable construction through the intelligent integration of building structure, fabric and services as a series of coordinated active systems working together.

Natural daylight  Exposed thermal mass  Self shading  Passive solar design  Recycled steel  High-performance glazing

Industrial by-product cement  Rainwater harvesting  Water-efficient appliances  Solar water heating  Sustainable drainage strategy  Photovoltaics

Water-efficient landscaping  Ground-source heating

These systems will be optimized using an advanced Building Management System

- Building Management System
- Metering
- Energy-efficient lighting
- Green screen
- Education
Four targets are set for the building

1. Meet the highest local standards for sustainable building: **breeam**

2. Meet the highest global standards for sustainable building: **LEED®**

3. Align the building with Siemens global strategy: An ‘All Electric’ Building

4. To approach a closed water cycle on site
A pool of experts supports the centre’s objective to be the knowledge hub for sustainable urban development, research and dialogue. These experts are to be located in the centre either permanently or on a project base.

“We will do all we can to bring together the capital’s invaluable expertise with Siemens’ amazing pool of international technology pioneers.”
- Boris Johnson
The Crystal will be at the heart of an area of urban regeneration

- Between Olympic Park and ExCeL London (Medal Ceremonies)
- Peripheral location close to London City Airport in an area of urban regeneration
- Good connection to London public transport system
- Proposed cable car (in red) across Thames will further enhance accessibility
Thank you!

Your feedback is always welcome. Send an email to thomas.brodocz@siemens.com for a personal response.